<u>CLAIMS</u>

1.   A method of forming a two dimensional map of a three dimensional environment, there being a map origin located in the three dimensional environment, a viewing direction vector defined passing through the map origin, and a one-to-one correspondence between map positions in the map and the directions of vectors passing through the map origin;

the method comprising the steps of:

associating an environment position in the three dimensional environment with a folded vector that passes through the map origin, the folded vector lying in a plane containing both the viewing direction vector and the environment position and forming an angle with the viewing direction vector that is a predetermined function of the angle between the viewing direction vector and a vector between the map origin and the environment position;

associating an environment position with the map position corresponding to the direction of the folded vector associated with that environment position; and

deriving properties for a map position from the properties of the corresponding environment position.

2.   A method according to claim 1, in which the predetermined function is a multiplication by a predetermined quantity.

3.   A method according to claim 2, in which the predetermined function is a multiplication by 0.5.

4.   A method according to any one of the preceding claims, in which the one-to-one correspondence of a map point with the direction of a vector through the map origin represents a projection onto a predetermined plane of a point on the vector which is a predetermined distance from the map origin.

5.   A method according to claim 4, in which the predetermined plane is a plane orthogonal to the viewing direction vector.

6.   An image rendering method comprising the steps of:

generating a two dimensional map of a three dimensional environment using a method according to any one of the preceding claims;

for a point of interest on an object to be displayed, deriving a reflection vector in dependence on a normal vector at the point of interest and a direction of view;

referencing a position in the two dimensional map using the reflection vector, to detect environmental properties at that map position; and

varying the appearance of the object at the point of interest in dependence on the detected environmental properties.

7.   A method according to claim 6, in which the varying step is performed in dependence on a reflectivity of the object at the point of interest.

8.   A method according to claim 6 or claim 7, in which the environmental properties represent lighting properties.

9.   Computer software having program code for carrying out a method according to any one of the preceding claims.

10.   A providing medium by which software according to claim 9 is provided.

11.   A medium according to claim 10, the medium being a transmission medium.

12.   A medium according to claim 10, the medium being a storage medium.

13.   Apparatus for forming a two dimensional map of a three dimensional environment, there being a map origin located in the three dimensional environment, a viewing direction vector defined passing through the map origin, and a one-to-one correspondence between map positions in the map and the directions of vectors passing through the map origin;

the apparatus comprising:

means for associating an environment position in the three dimensional environment with a folded vector that passes through the map origin, the folded vector lying in a plane containing both the viewing direction vector and the environment

position and forming an angle with the viewing direction vector that is a predetermined function of the angle between the viewing direction vector and a vector between the map origin and the environment position;

means for associating an environment position with the map position corresponding to the direction of the folded vector associated with that environment position; and

means for deriving properties for a map position from the properties of the corresponding environment position.

14. An image rendering apparatus comprising:

map generating apparatus according to claim 13;

means for deriving a reflection vector, in respect of a point of interest on an object to be displayed, in dependence on a normal vector at the point of interest and a direction of view;

means for referencing a position in the two dimensional map using the reflection vector, to detect environmental properties at that map position; and

means for varying the appearance of the object at the point of interest in dependence on the detected environmental properties.

15. A video game machine comprising apparatus according to claim 13 or claim 14.